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SHUFELDT — AMERICAN GROUSE AND THEIR IDENTIFICATION



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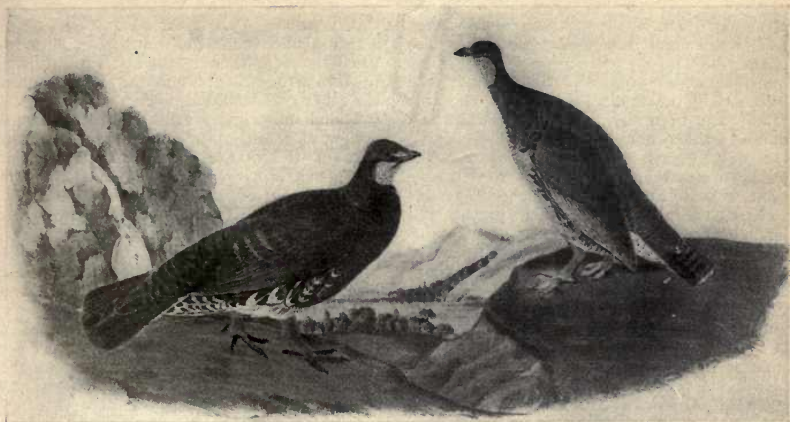


Fig. 1—The Dusky Grouse (*D. o. obscurus*). Male (the lower one) and female. Reproduction made by the author of Audubon's plate.

The American Grouse and Their Identification

By DR. R. W. SHUFELDT, F. A. O. U., ETC.

INTRODUCTION:—DUSKY GROUSE

PART I.

WITH ILLUSTRATIONS FROM PHOTOGRAPHS, BY THE AUTHOR



HAVING completed and published, in ten parts in Outer's Book, the contribution wherein I attempted—by the use of figures and descriptions—to present data, by means of which the ducks of this country could be

easily distinguished, I now pass to a consideration of the American Grouse,—a group of most interesting birds which will be treated here in a similar way.

In an article of mine, published in *The American Naturalist* (Vol. XXXVIII, Nos. 455-456, Nov., Dec., 1904, pp. 833-857), I give "An Arrangement of the Families and the Higher Groups of Birds," and in that arrangement the Gallinaceous Birds or fowls are arrayed in a Suborder (XXIV) *Gallina*, wherein are included seven families,—all more or less related to each other. These are the mound-birds (*Megapodidae*), the curas-

sows, guans, etc., (*Cracidae*), of which we have but one species in this country, namely, the Texan guan, and the several families containing the pheasants, the grouse, the quails, the guinea fowls, and the American turkeys; in other words, respectively, the *Phasianidae*, the *Tetraonidae*, the *Odontophoridae*, the *Numididae* and the *Meleagridae*.

From this it will be seen that fowls, as game, occur in nearly every part of the world with a truly marvellous array of genera and species. Of this immense host, however, I will consider here but the American forms of one family,—that is, the *Tetraonidae*, which includes the true grouse, the spruce partridges, ptarmigans, prairie chickens, sharp-tailed grouse and the sage hen. In other words, I shall have nothing to do with any of the four or five species of big, true pheasants, which we have introduced into several parts of the country, where they are now wild and rapidly increasing; nor with our various species of bob-whites

and quails; nor, finally, with our wild turkey and its several subspecies, and the chachalaca.

All the true grouse of this country are included in the family *Tetraonidæ*, and this family has been divided into seven genera, namely: the genus *Dendragapus*, containing the dusky grouse and its subspecies; the genus *Canachites*, containing the spruce grouses and Franklin's grouse; the genus *Bonasa*, containing the ruffed grouse and its subspecies; the genus *Lagopus*, containing some fifteen species and subspecies of ptarmigans; the genus *Tympanuchus*, containing the heath hen and prairie chickens; the genus *Pediæcetes*, the sharp-tailed grouse, and, finally, the genus *Centrocercus*, which has been created to contain the single species *Centrocercus urophasianus* or sage hen of the sagebush plains of the West.

These American grouse are found in various parts of the United States, and in Alaska and its off-lying islands. Grouse, entirely outside of these limits, will not be considered,—for instance, such a form as Welch's ptarmigan, which is confined strictly to Newfoundland. (*Lagopus welchi*).

No country in all the world can compete with North America in the great number and variety of grouse contained in its avifauna. At one time, they were all confined to the genus *Tetrao*, which is the Latin word for a grouse or a pheasant, and hence *Tetraonidæ* or the family created to contain them and their allies. We have no true *Tetrao* in this country now, which will be a surprise to most sportsmen; for, years ago, they all knew it as the word—the scientific word—which was applied to all true grouse everywhere. As a matter of fact, the late Professor Sharpe, in his "Hand-List of Birds," recognizes but five true species of *Tetrao*, the type being *T. urogallus* or the famous capercaillie, and forms more or less related to it which occur in Europe and northern Asia.

At one time, I know, the attempt was made to introduce the capercaillie into Maine; but how well it has done there, I am, at present, not informed. If it has thriven as well and as long as some of the Chinese and Japanese pheasants, which have been introduced into Oregon or elsewhere, it is now entitled to be recognized as a bird of this country, although an "introduced" one.

As in the case of the ducks, I shall adhere to the third addition of "The A. O. U. Check-List of North American Birds" as the authority for the number of genera, species and subspecies of our grouse, as well as for the sequence of the genera in the matter of

classification. This latter seems to be quite a natural one, and one of which I can approve, which is more than I can say with respect to the arrangements adopted for some of the other groups and families.

I shall now invite attention to a general review of these grouse, and devote the last part of the article to a consideration of the genus *Dendragapus*, which includes the various forms of the dusky tree grouse.

First in the list, then, we have the genus *Dendragapus*, derived from two Græek words, namely: *dendron*, a tree, and *agapao*, I love,—so named from the fact that these birds spend much of their time up in the trees.

Richardson's grouse (*D. o. richardsoni*) is a representative of this genus, and I have frequently shot them in Wyoming and the Northwest. Audubon, who never saw this bird alive, figured it on the ground (Fig. 1), notwithstanding what Townsend had written him about the habits of the bird.

These birds are all western forms, the group consisting of *Dendragapus obscurus* and four subspecies.

The next genus is the genus *Canachites*, containing the species *C. canadensis* and four subspecies which occur both in the East and the West.

Bonasa (*B. umbellus*) follows with four subspecies, also eastern and western forms. They are the well-known ruffed grouse (Fig. 2), the word *Bonasa* being derived from the Latin *bonusus*, which means to bellow,—the drumming of the ruffed grouse being here compared with the bellowing of a bull.

Next in order we find the ptarmigans of the genus *Lagopus* (Latin), birds so called for the reason that their densely feathered feet remind one of the furry feet of the hare.

There are many kinds of ptarmigans in our country,—all being of alpine or boreal distribution. One of their chief characteristics is that they assume a white plumage in winter. In this genus we find *L. lagopus* with three subspecific forms; *L. rupestris* with no fewer than seven more; *L. evermanni* which is a good example of a ptarmigan, and is here shown in figure 3. Finally, there is *L. leucurus* with its two subspecies.

True prairie chickens belong to the next genus, namely the genus *Tympanuchus*, which, under the species *T. americanus*, has two subspecies, while we also have *T. pallidicinctus*.

Prairie chickens occur both in the East and the West, and will be fully described in a future part of the present series. In the matter of derivation, I may say that *Tympanuchus* is badly constructed, being a combination of both Latin and Greek.

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Moulthrop



Fig. 2—Prairie Chicken (*Tympanuchus a. americanus*) Male. Reproduction of a photograph made by Mr. Geo. E. Moulthrop of Bristol, Conn., who mounted the specimen.

Tympanum is Latin (*tumpanum* Gr.), and means some sort of musical instrument after the order of a tambourine, or perhaps a kettle-drum. In anatomy, it has been applied to the ear drum (*tympanum*); the latter syllable of the word is from the Greek and means: I possess or I have,—the whole referring to the distensible air-sacs in this bird, one on either side of the neck. As is well known, these are featherless and capable of great expansion; it is with these that the bird “drums.” A good figure of a prairie chicken of the genus *Tympanuchus* is here presented in fig. 2; it is from a photograph of a mounted specimen, and was presented to me by Mr. Geo. E. Moulthrop of Bristol, Connecticut; it is *T. americanus*.

In some parts of the West, the pin-tail grouse of the genus *Pediaceles* are called “prairie chickens,” especially in the north-west. In this group there are three sub-species under *P. phasianellus*; they are all western forms and will be described hereafter. *Pedion* is the Greek for a plain, and *oikeles* (Gr.) for an inhabitant,—hence we have *Pediaceles* as a species of plains-grouse.

Our list of American grouse is completed by the sage cock or sage hen of the western plains,—a single species of the genus *Centrocercus* (Gr. *Kentron*, a prickle or spine, and *Kerkos*, tail), which will be fully characterized in the concluding part of the present series,—that is, in Part IV.

To further fix these genera of grouse, the following table will be found to be of some assistance:—

Dendragapus: Size large. Not crested. Well marked naked space on each side of neck capable of inflation, usually covered with special, but not conspicuous, feathers. Feathered to the toes. Tail squarish and generally composed of 20 feathers, rarely 16 or 22. Wing over 8 inches.

Canachites: Size medium. Sexes somewhat different. Not crested. No peculiar feathers on neck or head. Neck without naked spaces, but skin capable of slight distention. Colored, bare space over either eye. Nearly square tail shorter than wing; feathers stiffish and flat; usually composed of 16 feathers; very rarely 14 or 18, but

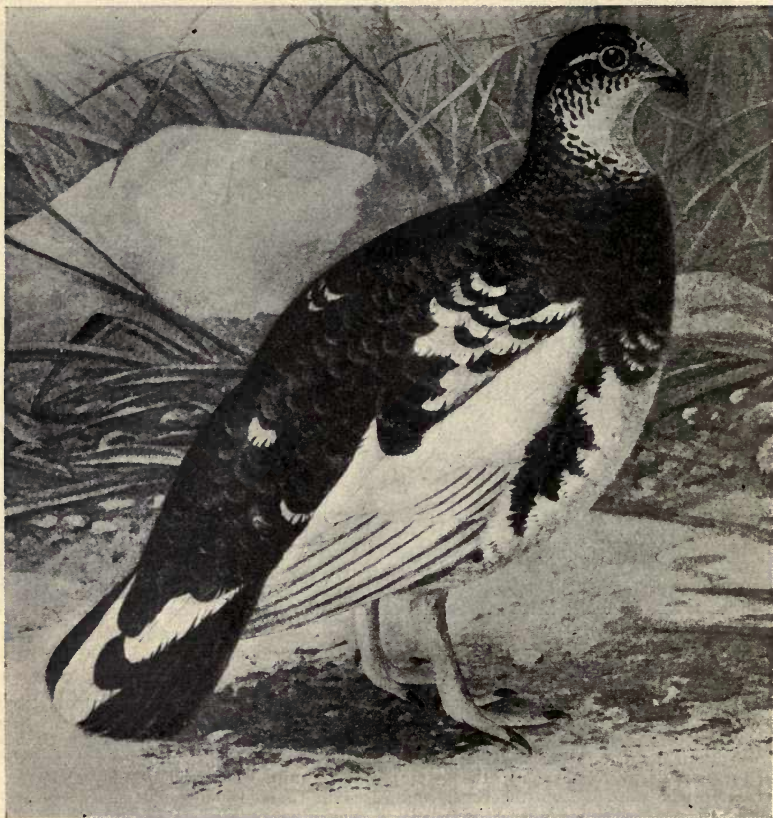


Fig. 3—Evermann's ptarmigan (*Lagopus evermanni*). Male, in June.

never over the last number. Full-feathered tarsi,—that is, feathers to the toes.

Bonasa: Sexes alike. Head full-crested. Black epaulette on either side of neck, where the "tympanum" is rudimentary. Tail and wings of a length, the former rounded and composed of 18 feathers, with distal ends truncated. Tarsi naked below, and otherwise very slightly feathered. Breastmeat white when cooked. An arboreal, woodland genus. (Said to be closely allied to the genus *Tetrastes* of Europe).

Lagopus: Head and neck plainly feathered. Tail barely rounded, short, with 14 feath-

ers,—16, if the long pair of middle feathers of the upper tail coverts are counted in. Unfeathered red comb over either eye. Tarsi and toes heavily feathered. White in winter.

Tympanuchus: Moderate, soft crest on head. Tuft of elongated, somewhat pointed loose feathers on the neck at either side. Below each of these is the yellow-skin tympanum, which is bare and capable of distention to the size of a big lemon. Tarsi bare posteriorly, but slightly feathered in front and laterally. Toes more or less webbed at their bases. Short, rounded tail composed of 18 feathers. Sexes

closely resemble each other. Terrestrial forms with dark breastcoat.

Pediaceles: Head moderately crested. No neck-feather ornaments, and the tympanum on either side rudimentary, with but slight change in feathers overlying them. Crescentic naked patch of peculiar formation over either eye. Tarsi full-feathered and the feathers long and hair-like. Tail shorter than a wing, and composed, normally, of 18 stiff, pointed feathers, the center pair softer, squared distally, and one or more inches longer than the one next on either side,—the remainder being graduated. Cock somewhat larger than hen, otherwise sexes similar.

Centrocercus: Very large species, and the largest of all American grouse. Air-sacs of neck large, peculiar in form and situation, being livid in color, and capable of extraordinary distention. In the very long tail, the feathers are narrow and graduated, being from 18 to 20 in number. They are likewise stiff and acuminate. The plumage about the tympanums remarkable in kind, structure and arrangement. Tarsi feathered as far as the toes. Sexes more or less alike in color of plumage; but the female is not as large as the male, and differs somewhat in form.

By careful study, use and consideration of these generic characters, one will meet with no trouble in referring any American grouse, at least, to the *genus* to which it belongs. To identify a species is another matter, and to this subject the remaining three articles of the present series will be devoted, beginning here with the grouse included in the genus *Dendragapus*. (Fig. 1).

This genus contains but one species,—that is, the famous dusky grouse *D. obscurus*, which has a general range, in suitable localities, extending over the Pacific coast regions and the Rocky Mountains. They may occur from the upper Mackenzie and Yukon Rivers, south to central Arizona, including all the mountainous regions of California. They are dark-colored birds,—hence the specific name *obscurus*. At the present writing, the genus contains *four* pretty well marked subspecies,—the type species being *D. o. obscurus* of the Rocky Mountain region, with a range extending from northern Colorado and Utah to the central regions of the western parts of Arizona and New Mexico, westward to Nevada as far as East Humboldt Mountains.

In varying localities, this bird is known as the dusky grouse, also the gray or pine grouse, and the pine hen.

They vary greatly in size,—old males

with a length of 24 inches have been found, though they average rarely more than 20, and the hen never over 19. Males have a wing-extent of 30 inches,—the wing being 9 or 10 inches, and the tail 7 or 8. In weight they run between 3 and 4 pounds.

Old cocks have a sooty-brown back showing zig-zag lines, made with fine markings of bluish gray, shaded with deep ochre, and with small, white areas on the shoulders. Flank feathers tipped with white and having white shaft-stripes. Below, slaty-gray with some white markings. Sides of head black, the chin and throat densely speckled with black and white. The somewhat enlarged feathers on the side of the neck have black tips, while their bases are white. The large, more or less rounded, brownish-black tail is mottled over with gray, it having a plain gray terminal band an inch or more wide. The 20 feathers composing it are broad for their entire lengths, the whole appendage being very handsome and striking.

The dusky grouse has a black bill, orange irides tinged with brown, with the comb over either eye and tympanums all yellow.

In the smaller hen, the coloration is lighter, the ochre and white markings being more varied, though the slate-blue under-parts and tail-bar are quite distinctive.

Pullets resemble the female, though the shaft lines of the feathers of the upper parts are peculiarly marked with white. Tail with shaft-lines white, enlarging distally; the feathers occasionally barred transversely with wavy, blackish bars.

Many sportsmen are familiar with this big, clumsy grouse, and have called it the "fool-hen" for the reason that it seems to have no fear of man whatever. Years ago, when I met with them in the Rocky Mountains, I noted—as has everyone else who ever shot a blue grouse—that upon being flushed, they almost invariably flew up into one of the tall pines at hand, from which place it was no trouble to shoot them either with a rifle or shotgun.

Variations—in the matter of plumage and other characters which are constant—are accountable for the defining of the remaining three subspecies of this bird.

The form that ranges northwesterly through the coast mountains of California and Oregon as far as Sitka, Alaska and the South Yukon region, is known as the sooty grouse (*fuliginosus*, sooty) or *D. o. fuliginosus*. This sooty grouse shades into the dusky grouse (*D. o. obscurus*) in Nevada and Idaho, and into Richardson's grouse (*D. o. richardsoni*) in various points in the Rocky Mountains,—the latter ranging from southwestern Mackenzie to eastern Oregon, Montana and Wyom-

ing. Finally, there is the Sierra grouse, found from Fort Klamath, Oregon, south through the mountains of California to Mount Pinos near Tejon. This subspecies is the *D. o. sierræ* and was first differentiated by Mr. Chapman.

A brief table is probably the best way to present the distinctive plumage differences characterizing these remaining subspecies of dark grouse, thus:—

Sooty grouse: Colors darker than in *richardsoni*. Tail-bar less broad than in true *obscurus*. On the upper parts, the male is blackish, finely speckled with slate-gray and reddish-brown. Under parts, dark slate-color or plumbeous. White markings on shoulders and flanks very indistinct. Female exhibits still greater differences, being known at once by her elegant brown markings of chestnut and rusty shades. The eggs of all these grouse are practically indistinguishable.

Richardson's grouse: Closely resembles in all particulars the true dusky grouse. However, the tail is generally longer as well as squarer, having the individual feathers broader, and the terminal slate-colored bar very much reduced and often entirely absent. The throat is blacker, and the entire bird much darker in its plumage. (Fig. 1, which Audubon gave us as the "Dusky Grouse," resembles, in

some respects, Richardson's grouse, especially in the tail).

Sierra grouse: As stated above, this subspecies was first described by Mr. Chapman and in the following words: "Most nearly related to *Dendragapus obscurus* but the nuchal region oftener browner and usually vermiculated with black, the whole dorsal region less black and more heavily vermiculated with brown and gray; terminal tail-band narrower and more speckled with blackish; the median tail-feathers more heavily marked with gray or brownish; the scapulars and tertials with the terminal white wedge less developed or entirely wanting; the basally white neck-tufts practically absent; the throat averaging duskier and the feathers of the sides, flanks and under tail-coverts with much less white."

This bird differs from the sooty grouse "in much paler coloration above, in the heavier vermiculation of the entire upper surface, practical absence of neck-tufts, white throat and paler underparts." (Bull. Am. Mus. Nat. Hist. XX. Apr. 25, 1904, 159).

It is said that the hens of the sooty, the dusky and the Sierra grouse, in their breeding plumage, are hardly to be distinguished apart. Some few differences, however, are to be seen in the tails,—the "band" being wider in the dusky, and the central feathers being less definitely barred in the Sierra form.

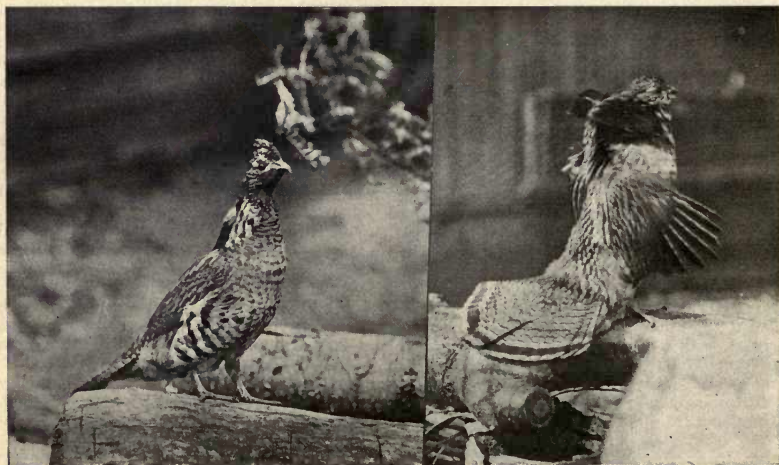


Fig. 4—Ruffed Grouse (*Bonasa umbellus*). Male, at rest (on the right) and drumming. Reproductions from photographs from life by Professor C. F. Hodge.

Equality

FROM THE FORELOPER'S POINT OF VIEW

By NELSON M. BLAIR

We found it at last when we rummaged the
place,
Though neglected for many a day,
With a holster so worn it was not worth the
name

And a belt that showed signs of decay.
'Twas like meeting a friend who was long
lost to view

With an outstretched and welcoming hand,
And it brought to remembrance the faces and
scenes

We knew when no man owned the land.

Just a plain forty-five but it seemed like old
times

When I "reached for" and "pulled" it once
more
And its ready response when the "action" I
tried

Showed the same "sudden" traits as of yore.
When the measure of men was their courage
and skill

As the highway of Empire they blazed,
And the "things" that they did in their own
simple way

Made the rest of the world stand amazed.

When a friend was a friend who would see the
thing through

Though the prospect looked slim from the
start,
Whose word was a bond that was not paid in
gold

Nor offered for sale in the mart;
When the courts of Injustice did *not* hold the
reins

And men had no laws to despise;
When the weak and the strong by a Colt
forty-five

Were made equal and all of one size.
Who says they are dead? They are living
still

In the hearts of the few who survive.
And their record is written in crimson flame
And signed with a "forty-five."



The American Grouse and Their Identification

By DR. R. W. SHUFELDT

THE SPRUCE PARTRIDGES: FRANKLIN'S GROUSE AND THE RUFFED GROUSE

PART II.

WITH ILLUSTRATIONS FROM DRAWINGS AND PHOTOGRAPHS BY THE AUTHOR



ANY years ago, I published, in one of the U. S. Government Reports, a very full and illustrated account of the skeletons of all of our American grouse and their allies, and since, a great many illustrated papers and books on the skeletons of hybrid grouse, turkeys, pheasants, all the quails, and no end of foreign species. I have also published the skeletons, or bones, of not a few fossil species of these groups, and I have often wondered whether the day would ever come, when such information, as I presented in those publications, would become so generally disseminated that any intelligent person, interested in our game birds, could, by a mere glance at any distinctive bone of any one of them, say off-hand what that bone was and to which species of grouse, for example, it belonged. Some of the bones of the skeleton of some grouse are very characteristic of the species; and one, at all familiar with them, could name the species to which they belonged without a particle of trouble. For instance, I can distinguish between the pelvis of a ruffed grouse and a prairie chicken (*Tympanuchus*) with my eyes closed, simply by handling them. Were such information general, my task here, giving rules and characters for identifying our American grouse, would be very considerably lightened.

In Part One of the present contribution, the species and subspecies of but a single genus of American grouse were treated, with respect to identification; that is, the dusky grouse, *Dendragapus*, and its three subspecies.

In the A. O. U. Check List of North American Birds, the next two genera directly following *Dendragapus* are *Canachites* and *Bonasa*,—the first containing the spruce partridges and Franklin's grouse, and the second the various forms of the ruffed grouse. Both these genera, as genera, have been characterized in Part One.

The species *Canachites canadensis* or spruce grouse, is a typical tree grouse occurring, in suitable localities, in the forests of Canada and Alaska, as far south as the boundary of the United States. There are three subspecies of the bird described by science, namely the Hudsonian spruce partridge (*C. c. canadensis*), which has a range throughout the boreal wooded region of the North, extending from the eastern base of the Rocky Mountains, westward to Edmonton, Alberta, east to the Peninsula of Labrador. It also occurs, in a special limited area, in Alaska, which entitles it to a place in our United States avifauna. This area extends from Bristol Bay to Cook Inlet and Prince William's Sound. A paler form of this bird, known as the Alaska spruce grouse (*Canachites canadensis osgoodi*) is found at Lake Marsh, Yukon, Northwest Territory, and has been fully described by Dr. Bishop in *The Auk* (XVII. April, 1900, 114); and, finally, we have the Canada spruce grouse (*C. c. canace*).

True *canadensis* is referred to by a number of common names, some of which probably include other forms of *Canachites*. Some of these names are: the Canada grouse; black grouse; wood grouse; spotted grouse; spruce grouse or partridge; swamp or cedar partridge. Its scientific vernacular name, however, is, as I say, the Hudsonian spruce partridge. The adult male, in full plumage, is slightly crested; but when the crest is lowered, the head is smooth. Over the eye, the comb is naked and colored a clear yellow, changing to a pale red under certain emotions.

In this species, the upper parts are barred in a wavy fashion with gray and black, with occasional rufous markings on the wings and back, which, on the wing-coverts and shoulders, are replaced by white. Beneath, the plumage is a shiny black, much variegated with white; the throat is bounded by white spots, and some of these occur on the sides of the head. Breast and sides white-barred, passing to semi-circles behind. The lower tail-coverts have the feathers also white-

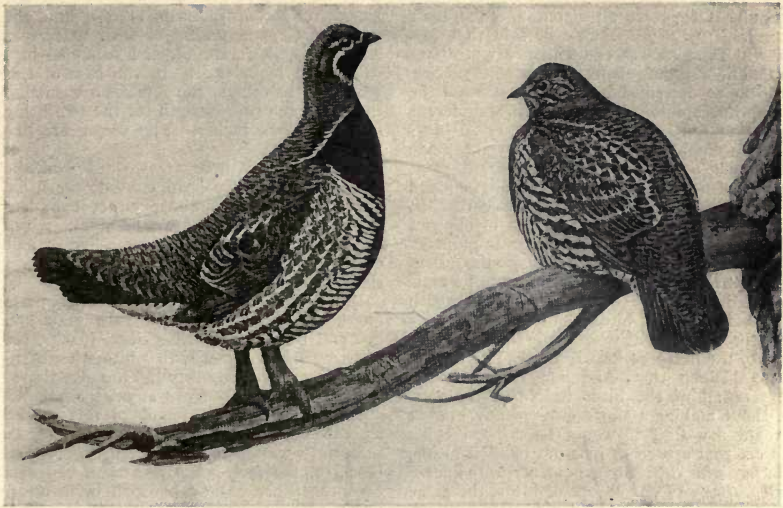


Fig. 5.—Male (standing) and female Canada spruce grouse (*Canachites c. canace*). By the author after Fuertes.

tipped. There are 16 feathers in the black tail which is slightly rounded, each feather being uniformly nearly an inch wide. Distally they are tipped with brownish orange, the feathers of the upper coverts being occasionally bordered with gray, often extending on to the edges for a little distance.

The legs (*tarsi*) are fully feathered to the toes, the latter being naked, covered with scales, and each fringed with a comb-like growth which is shed and reproduced during the moult.

An old male of this species, in the breeding season, appears to one as a black bird, grayish above, white-spotted beneath, and a black tail with reddish-brown ends to its feathers. Total length averages from 15 to 17 inches; a wing 7, and the tail 5½ inches,—the smaller measurements being for the female bird. In the latter, the black is not continuous beneath as in the cock, being replaced by tan and white, especially on the breast, with white streaks on the flanks. In fact, the hen of this species is more or less barred elsewhere with fine, wavy markings of dull black, giving the *tout ensemble* of the plumage a very different appearance from the male. On the upper part, she more resembles the cock bird, but is browner, the ends of the tail feathers more narrowly edged with brownish-orange, with all of the feathers more or less banded with buffy

ochre, which bars, or bands, are said to disappear gradually as the bird ages. Sub-adults resemble the females, while the chicks look like those of the ptarmigans with unfeathered toes.

Students of our grouse will find them much mixed up in the literature on the subject; as for example, Ridgway, in his *Manual of North American Birds*, bunches together the genera *Dendragapus* and *Canachites*, including them all in the former genus. Audubon, however, was far less to be trusted in this matter, for to him all "spruce grouse" looked alike. In his description of the Canada grouse (*Canachites canadensis*), which, under the rule of those days he placed in *Tetrao*, he says in the fifth volume of his great work "According to Dr. Richardson, all the thick and swampy black-spruce forests between Canada and the Arctic Sea abound with this bird, and considerable numbers exist in the severest seasons as high as the 67th parallel. I am informed by Mr. Townsend that it is also plentiful on the Rocky Mountains and the plains of the Columbia, from which parts I have obtained specimens differing in nothing from others procured in Maine and Labrador. I have also compared those in the Edinburgh Museum, which Mr. Douglas was pleased to name *Tetrao Franklinii*, with several of my own, and feel perfectly confi-

dent that they are all of one and the same species," (p. 87). It may be said that Mr. David Douglas was eminently correct about Franklin's grouse being a distinct species, and he so described it in 1829 in face of the opposite opinion of such an indifferent observer of the specific differences in birds as was Audubon, who was totally incapable of noting any in the cases of four different kinds of American grouse now all included in the genus under consideration,—that is, the genus *Canachites*. The idea of one not being able to see the differences in plumage between an adult male dusky grouse (*Dendragapus obscurus*) and an adult male Franklin's grouse (*Canachites franklini*), with the skins of the birds before him! If any of the sportsmen who read these articles are of the immense host in the United States, who believe that Audubon *described* and *figured* all of the birds in North America, without making a single error of any kind, I would say that it would be a good thing to get that erroneous idea out of their heads, if they ever expect to gain an accurate knowledge of any of our groups of birds, the game birds included. Audubon did not see, much less describe and figure, one in fifty of the birds of North America; the text, figures and classification of his work are—each and all—pregnant with errors; and had it not been for the vastly superior knowledge of the distinguished Scotch ornithologist, William MacGillivray,—who more than assisted him,—he would never have been able to get out the *text matter* at all. Even Macgillivray did not have the opportunity to see but a comparatively small part of Audubon's MSS. before they went to press, as his work in natural science practically occupied all his time and prevented him from doing so. He was, moreover, born in Aberdeen, and lived and died there. Most of Audubon's life was spent in this country.

Of the *Canachites canadensis* series, I still have to describe the last subspecific form. This is the Canada spruce grouse (*C. c. canace*) Canace was the daughter of Æolus, the Greek word meaning a noise. Figure 5, here reproduced, gives a beautiful representation of the male and female of this bird—an illustration I obtained by photographing Plate 41, of Eaton's "Birds of New York," the original having been made by Mr. Fuertes.

The Canada spruce grouse ranges through Manitoba, southern parts of Ontario and New Brunswick, and, within the boundaries of the United States, through certain regions of New England, New York and westward as far as northern Minnesota. This is the

Tetrao canace of Linnæus (1766), and the common Canada grouse of such writers as Audubon and Coues, which last-named bird with them includes it. In the case of this grouse as in others, the females are smaller than the males, the length for the two being from 15 to 17 inches. The young are like the hens.

In this form there are no ruffs on the neck, neither is the head crested; the usual bare orange spot is above either eye; legs (*tarsi*) are feathered to the toes, which latter have the horny, comb-like fringe on their sides referred to above; tail feathers sixteen.

In the male, the sides and upper parts are generally wavy, barred with gray and black. Beneath, mostly clear black, the feathers being tipped with white; the feathers of the otherwise black tail are also tipped with a brownish-orange of an ochereous shade.

Eaton describes the female of this species as taken in New York State, as "quite uniformly varied with ochereous, gray and blackish, the gray appearing as a veil cast over the ochereous and blackish bars; under parts with white feather tips" (p. 365). (Fig. 5, the sitting bird).

Finally, we have in this genus the distinct species *Canachites franklini*, — Franklin's grouse. This elegant bird was first discovered by Lewis and Clark in Idaho in 1805, but not scientifically named. As above stated, it was again discovered by David Douglas in the then territories of Washington and Oregon, who named it *Tetrao franklini* after the distinguished Arctic explorer, Sir John Franklin. (Trans. Linn. Soc. Lond. Vol. xvi. 1829 p. 139). Both Swainson and Bonaparte have given us figures of this species, and Figure 6 of this Part, reproduced from my own drawing of a male in full plumage, is another contribution in this direction.

In all particulars, Franklin's grouse has the general appearance of the Canada grouse described above; but in its range, it is restricted to the central parts of British Columbia, southern Alaska, and the western regions of central Alberta. From these parts it ranges southward through the forest districts of northern Oregon, central Idaho, and the forested regions of the western parts of Montana. Personally, I have shot this grouse in the extreme lower part of its range in Montana.

As will be observed in Figure 6, the tail is relatively—as well as actually—longer than it is in the Canada grouse, and the white tips to the broader feathers are very scant. Moreover, distally, the tail in Franklin's grouse is nearly even, and it lacks the



Fig. 6.—Franklin's grouse (*Canachites franklini*). Reproduction of a painting made by the author.

terminal orange-brown bar. The white tips to the outer row of feathers of the upper coverts lend to the superior aspect of the tail a decided spotted appearance, especially when the bird is at rest, as shown in Fig. 6.

Having a knowledge of its range and the above characters, one will have no trouble in distinguishing a Franklin's grouse of the genus from the Canada grouse, or, indeed, from any other *Canachites*.

Few of our grouse are better known to our sportsmen than those grouped in the genus *Bonasa*, which contains the ruffed grouse; yet there is not one hunter in a hundred in this country who is aware of the fact that

we have several sub-species of this elegant bird.

Bonasa umbellus, owing to the presence of its peculiar spreading neck-tufts, gets its specific name from a Latin word having reference to an umbrella (umbel); note also *umbra* a shadow or shade, used in many senses.

B. umbellus occurs in certain localities where suitable forests exist, in Alaska and Canada, and southward to California, Colorado, Kansas and Tennessee. In the East it is found in the Alleghanies, as far south as Georgia.



Fig. 7.—Ruffed grouse (*B. u. umbellus*). Reproduction of a photograph from life by Professor C. F. Hodge.

The type species, *B. umbellus umbellus* or the ruffed grouse, ranges over the eastern United States from southern New York westward through Michigan and Minnesota. On the Atlantic side, from southern Vermont to northern Georgia, including Virginia; thence westward, we find it in eastern Kansas, northern Arkansas and Tennessee. Throughout the New England part of its range, it is very generally known as the "Partridge," while in the middle and southern states, it is everywhere called the "Pheasant." It has some nine or ten vernacular names, which are not worth our while to record. Much confusion would be avoided if the birds could be called "Ruffed grouse" everywhere, simply stating, as occasion required, whether the Canada, the Gray, or the Oregon ruffed grouse was in question.

In Figure 7 of this Part, we have a reproduction of a photograph of the ruffed grouse (*B. u. umbellus*), taken from life by Professor C. F. Hodge of Clark College, Worcester, Massachusetts, who presented it to me. The bird is seen to be "strutting," and it doubtless formed the model for Fuertes' colored figure in Eaton's "Birds of New York." (Plate 41).

Figure 8 is another of Professor Hodge's photographs reproduced; it is probably the

same bird (male) "day-dreaming" on a log, and it is an interesting picture.

Figure 9 gives the skins of various specimens of ruffed grouse,—a cut I obtained by photography from an illustration in Eaton's "Birds of New York," (p. 372). It will be seen that these four grouse skins were taken as they rested on a plane surface on their backs. They are of "*Bonasa umbellus* from New York State, showing graduation from *B. u. umbellus* on the right (Bergen, Genessee County), to *B. u. togata* on the left (Upper Ausable Lake). The intermediates are from Saratoga County and southern Ontario County." (Compare also with Fig. 2 of Part I). These birds produce their "drumming" by rapidly whirling their wings, *neither of the latter coming in contact with anything*. Most of the ruffed grouse I have shot were met with in New England (Conn.) and were *B. umbellus*, wherein the upper parts are variegated with grayish or reddish brown, which, on the back, is spotted all over with pale, oblong, black-edged spots. The under parts are more or less white and transversely barred with pale brown. The brown or gray tail is tipped with the latter color, and is otherwise marked with many transverse, narrow, black bars, the sub-terminal broad one being also black. At the neck, the "ruffs" are either



Fig. 8.—Ruffed grouse (*B. u. umbellus*). Reproduction of a photograph from life by Professor C. F. Hodge.

black or brownish black, being smaller and browner in the hen. In the male, it has a steel-blue or dark greenish iridescence.

With this description before one and knowing the range—taken in connection with the cuts presented—almost anyone would be able to identify a ruffed grouse—that is, *Bonasa u. umbellus*. This says nothing for the subspecies—that's another affair—and we will take those up at the close of the article. Before doing so, however, it will be of interest to cite a few observations of other ornithologists upon the type *species* now being considered.

Wilson, who gives a long and very interesting account of this bird, says "Dr. Turton and several other English writers, have spoken of a Long-tailed Grouse, said to inhabit the back parts of Virginia, which can be no other than the present species, there being, as far as I am acquainted, only these two, the Ruffed and Pinnated grouse found native within the United States."

At the present writing, there are between thirty and forty kinds known, which includes the Alaskan forms.

As part of a very accurate description, Wilson further says, "The Pheasant, or Partridge, of New England, is eighteen inches long, and twenty-three in extent; bill, a horn color, paler below; eye, reddish hazel, immediately above which is a small spot of bare skin, of a scarlet color; crested;

head and neck variegated with black, red, brown, white, and pale brown; sides of the neck furnished with a tuft of large, black feathers, twenty-nine or thirty in number, which it occasionally raises; this tuft covers a large space of the neck destitute of feathers; * * * * the legs are covered half way to the feet with hairy down of a brownish white color; legs and feet pale ash; toes pectinated along the sides; the two exterior ones joined at the base, as far as the first joint, by a membrane; vent yellowish rust color."

Ridgway, who describes the downy young, etc., gives the length as 15.50 to 19 inches, (Manual, p. 197) or an inch more than Wilson's measurement. We know that the hen is considerably smaller than the cock bird. He further states in the same place that in the female "the neck-tufts are rudimentary or obsolete."

Coues, in the last edition (5th, p. 741) of his "Key," agrees with Wilson in the size of *B. umbellus* and says, among other things, "Young of both sexes sufficiently resemble the adults to be unmistakable, and detailed description of every feather would be tedious and profitless. Chicks in down are very pretty, being of various buff shades deepening on some parts into chestnut, with a black stripe on each side of the head. There is a sort of dichromatism in this species, somewhat like that of the red and gray Megascops owls,

some individuals being browner, others grayer, than the average; but this is irrespective of age, sex, season or locality, does not in the least correspond with the pretended geographical distribution of the subspecies *togata*, which some late grouse-fanciers have sought to establish, and I cannot imagine myself humoring such a whim in the "Key." We have quite enough to do in making out *umbelloides* to be subspecifically different."

Eaton, in the "Birds of New York" (p. 367) states, "This species, like the Screech Owl, exhibits a kind of dichromatism, some specimens having a prevailing rufous, or reddish brown color of the upper parts, especially the tail, and others a prevailing gray, which is not by any means confined to the subspecies *togata*, but is exhibited by southern birds as well, both types of color often occurring in the same brood." This offsets what Coues had to say about *B. u. togata*, and properly so. Coues, in giving his description of birds, was only too often influenced by his moods.

Audubon tells us that the "drumming" of the ruffed grouse is produced as it "beats its sides with its wings in the manner of the domestic cock, but more loudly, and with such rapidity of motion, after a few of the first strokes, as to cause a tremor in the air not unlike the rumbling of distant thunder." I was under the impression that "a tremor" was a vibratory movement, and not a noise of any kind.

Audubon is much nearer the truth when he states, in regard to the ruffed grouse, that "A remarkable difference of plumage is observed in specimens from the opposite parts of the continent, those from the eastern districts being invariably much greyer, especially on the tail-feathers, than those procured along the Ohio, or in Virginia. These constant differences have tempted some persons to suppose that we have two nearly allied species, instead of one; but after the closest examination of all their parts, as well as of their habits, I never could find anything tending to support this supposition." (Vol. v. p. 81).

I have already given above the range of *B. u. umbellus*, and the following are the ranges of the three remaining subspecies as given by the A. O. U. "Check-List" (1912).

Bonasa umbellus togata. Canada Ruffed Grouse.—"Range: Central Keewatin, southern Ungava, and Nova Scotia south to Manitoba, southern Michigan, northern Vermont, New Hampshire, and Maine, and in the mountains of New York, western

Massachusetts, and northern Connecticut; birds indistinguishable from the eastern form occur from east central British Columbia south to eastern Oregon and central Idaho.

Bonasa umbellus umbelloides. Gray Ruffed Grouse.—"Range: Norton Sound, Alaska, east to central Yukon and west central Mackenzie, and south to northern Utah, northern Colorado, and western South Dakota."

Bonasa umbellus sabini. Oregon Ruffed Grouse.—"Range: Coast ranges from southern Alaska to Humboldt County, California."

It must be remembered and distinctly understood that these three subspecies, at their limited boundaries of their several ranges, by insensible degrees shade into each other, which statement includes *B. umbellus umbellus*. On this point Eaton remarks, "It is impossible to draw definitely the boundary between the ruffed grouse proper (*umbellus*) and the Canadian ruffed grouse (*togata*), as there is a continual gradation from the birds of southern New York to those of the Adirondack forests, which are certainly of the subspecies *togata*. Birds from the highlands of eastern and western New York are intermediate between the two" ("Birds of New York," p. 367). (See Fig. 9).

Ruffed grouse from the Adirondacks are typical of the Canada ruffed grouse (*B. u. togata*) and they are of the same size as *umbellus*. They are much darker in color,—particularly is it to be noticed that the transverse barring of the parts beneath are so. These markings are dusky across the breast, passing to black as we pass over the flanks on either side. All the edgings of the feathers in these localities are black or blackish. Above, the bird inclines to be grayish, the upper part of the tail being, in fact, a clear gray color.

Coues, in describing the plumage of the gray ruffed grouse (*B. u. umbelloides*) says of the male bird, "Lower back, rump, upper tail-coverts and tail slate-gray, with little if any brown tinge; the feathers of the back and rump with light gray cordate or arrow-headed spots, narrowly bordered with black; tail-feathers finely vermiculated with black, and with a broad, subterminal black zone. Ruffle glossy greenish-black. Under parts whitish, more or less tinged with tawny-brown, with several broad brown cross-bars on each feather, largest and most distinct on long feathers of sides, some of which have also white shaft-lines; heavy feathers of flanks and vent mostly whitish, unmarked. Feath-

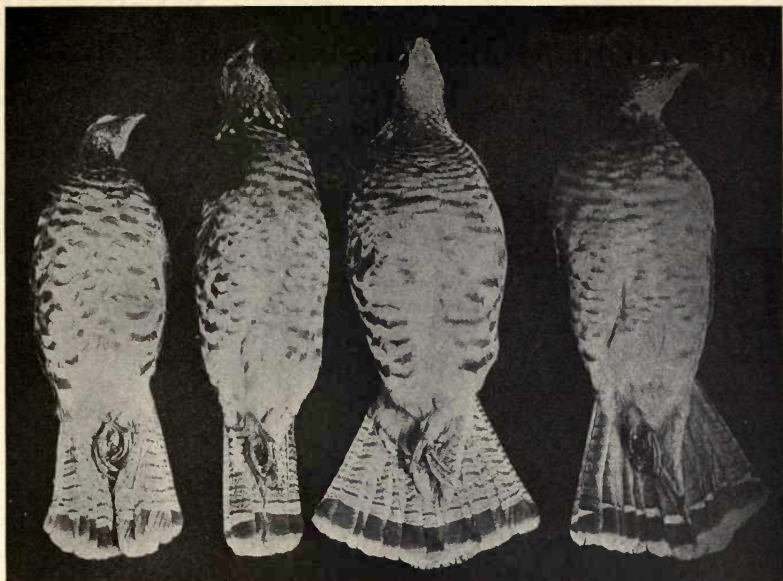


Fig. 9.—Skins of *Bonasa* (*umbellus* and *togata*). By the author after Eaton.

ers of fore-neck and scapulars blended with gray, rich reddish-brown, ochrey-brown, and white in indescribable confusion. Most of the wing-coverts with white shaft-lines. Hen with ruffle less developed varied with brown and white. General tone more rufous than in the cock." ("Key." 5th Edition, pp. 742, 743.)

The Oregon ruffed grouse is named for J. Sabine, *B. umbellus sabini*, and its discovery and rediscovery by David Douglas is interesting in American grouse history,

but has little to do with up to date identification.

This subspecies more closely resembles *B. u. umbellus*, but the brown shades in it are darker and more extensive than in the latter form. In fact, the color is more elegant and far richer. In some parts of the plumage it approaches a chestnut shade, glossy and handsome, which passes to blackish in the browns. These are only the typical examples, however, from the center of the range, as pointed out above.



Time Wrought Modifications of the Hunting Knife

By R. A. KANE

PART II

WITH ILLUSTRATIONS FROM PHOTOGRAPHS AND DRAWINGS.



ON another occasion I was still-hunting in the edge of the green wood which marked the limits of the broad expanse of burnt district. It was good deer country, and I was momentarily expecting to get a standing shot or to see the flash of white that would be the signal for action on my part. While stepping cautiously along and peering carefully in every direction, I was suddenly startled by the vicious crack of a high power rifle on my left and seemingly but a few rods distant. Instinctively I sprang forward to the inviting shelter of the trunk of a green hemlock, placing it between me and the direction from which the sound had come. The reason for my sudden and unpremeditated action will be clear to those of our readers who will remember that there is no closed season on hunters in Wisconsin and Michigan. I stood edgewise to the trunk of the tree, hugging it closely. As soon as my wits were in working order, I yelled lustily, though nervously to apprise the shooter of my proximity. He answered promptly with the woodsman's hail (a full mouthed call) ending with a clear far sounding whoop. In less than a minute the invisible hunter emerged from behind a cluster of young balsams, and as



A YOUNG HUNTER'S KNIFE, WITH HANDLE OF LEG BONE FROM FAWN

he approached said, "Guess you jumped him for me."

"Jue get him?"

"Sure."

"Bully for you," and together we walked a distance of about fifty yards to where a fine young buck lay with a .30-30 through his neck.

"Got him standin' when he was listening on his back track" explained the stripling hunter.

It was a mild November day and as he wore no coat, I noticed that he apparently carried neither belt or hunting knife, and that his supply of cartridges was carried in the hip pocket of his mackinaw trousers in the original card-board box. Resting his rifle against a convenient tree he proceeded to dress his game with the most unique specimen of cutlery that was ever carried by a sportsman. The blade was shaped like that of a cobbler's knife, exactly like the ones we have seen used by the spectacled village shoemaker to trim the sole, and which was sharpened ever and anon on a fragment of coarse grindstone, or a sheet of sandpaper, tacked to his work bench. The young hunter's blade was less than three inches in length, its back straight, and the edge curved sharply from handle to point. A strong tang about equal in length to the blade was left for the handle, and upon this was tightly driven about $3\frac{1}{2}$ inches of the leg bone of a fawn, the enlargement at the joint forming a sort of natural guard for the hand. As he proceeded with the work of dressing his game, I watched him with considerable interest as I was curious to know what sort of a job could be done with such an inferior looking tool. He first made a small incision at the throat, not longer than the width of his blade, then cutting latterly under the skin, he severed the jugular, windpipe and gullet. After neatly circling the vent of the body with the slender point of his knife, he made an incision about five inches long extending back from the navel, then inserting his forearm into the opening thus made, with a few dexterous cuts of his short blade, the diaphragm and other natural adhesions were cut away, while heart, liver, lungs, as well as the baser parts were easily withdrawn, from front and rear. When assisting my young friend to hang the deer for drainage, I noticed that there was scarcely a stain on the beautiful snow white hair of the under parts, and there was practically none of the meat exposed to tempt, either predatory birds or animals. I had learned something new about the hunting knife.

Notwithstanding the countless number of hunting knives manufactured by our great



Fig. 10. Willow ptarmigan or grouse (*L. l. lagopus*). Male bird standing; female sitting with chicks. Reproduction of a photograph made by the author of Audubon's plate.

The American Grouse and Their Identification

By DR. R. W. SHUFELDT

PTARMIGANS, PRAIRIE CHICKENS AND THE HEATH HEN

PART III

WITH ILLUSTRATIONS FROM DRAWINGS AND PHOTOGRAPHS BY THE AUTHOR



IF we regard such birds as Richardson's, Franklin's and the ruffed grouse which were considered in Parts I and II of the present article, as true grouse, then the genus of birds first to be dealt with here, namely the ptarmigans of the genus *Lagopus*, form very distinct departures from our type forms. As a matter of fact, it has only been through

custom that we have regarded such a species as the ruffed grouse to be a true game bird called *grouse*, and the ptarmigans—forms considerably away from such an elected standard—are hardly entitled to that sort of distinction. In reality, however, a ptarmigan is just as true a tetraonine bird—even to the minutest structural detail—as the finest ruffed grouse that ever flushed from cover, or the best cock “prairie chicken” that pointer ever put up on a prairie.

The late Dr. R. Bowdler Sharpe in his



Fig. 11. Rock ptarmigan (*Lagopus r. rupestris*). White one in background, male in winter; the one looking back is a female in summer plumage; the bird in front of her "young in August." Reproduction of a photograph made by the author of Audubon's plate.

"Handlist of Birds" gives the ptarmigans (*Lagopus*) the leading place in the family *Tetraonidae*, enumerating 14 species of them, 11 of which occur in America, and the others in Europe and Asia,—the type, or willow-ptarmigan (*L. lagopus*), ranging through the northern part of the Northern Hemisphere, and consequently is common to both continents.

In some localities, these ptarmigans are known as snow grouse, as they are of both boreal and alpine distribution, and in mountain ranges where they occur are found above the snow-line. In general form they resemble the spruce grouse of the genus *Canachites*, and probably are most nearly related to them.

Ptarmigans have three moults during the year, the summer plumage being different in some species in the two sexes. Our forms in winter are pure white, some species having a black tail and a black stripe from bill to eye on either side. (Fig. 11). In shedding their feathers, which is often frequent and rapid, they even shed the horny coverings to the claws,—a process that happens periodically. In summer they exhibit a great variety of mottled patterns of plumage, black, browns and white prevailing, with various tawny shades. In all save one species, the subadults shed their brown flight-feathers, which are replaced by white ones, and these and many other plumage changes in this genus of grouse render the matter of color alone a somewhat unreliable character in specific distinctions.

Coues remarks: "The word *ptarmigan*, with an unexplained initial *p*, dating back over 200 years, is from the Gaelic *tarmachan*, supposed to mean mountaineer, and was earlier spelled *termigant*, *termagant*, etc."

We have a long list of ptarmigans in the avifauna of North America, and some of the subspecies are confined to very limited areas. In the matter of their appearance and habits they are much alike, so we can afford to slight quite a number of them, simply making a note of their names and existence.

According to the A. O. U. "Check List," their ranges are as follows:

Lagopus lagopus: Range—Northern part of the Northern Hemisphere.

L. l. lagopus: Willow ptarmigan. Range—Arctic regions. In America breeds from northern Alaska, northern Banks Land, and central Greenland south to eastern Aleutian Islands, central Mackenzie (in the mountains to west central Alberta), central Keewatin, James Bay, and southern Ungava; south in winter to northern British Columbia, Saskatchewan Valley, Minnesota, Ontario and Quebec; accidental in Wisconsin, Michigan, New York, Maine and Massachusetts.

L. l. alleni: Allen's ptarmigan. Range—Newfoundland.

L. l. alexandre: Alexander's ptarmigan. Range—Barranoff and adjacent islands west to Shumagin Islands.

L. l. ungavus: Ungava ptarmigan. Range—Ungava and probably the eastern shore of Hudson Bay.

Lagopus rupestris: Range—Northern North America and Greenland.

L. r. rupestris: Rock ptarmigan. Range—Arctic America. Breeds from Melville Island to Melville Peninsula and south on the Barren Grounds from Alaska to Ungava; also on alpine summits south to central Yukon; south in winter to southern Massachusetts and southern Ungava.

L. r. reinhardti: Reinhardt's ptarmigan. Range—Northern extremity of Ungava, western Cumberland Sound, and Greenland.

L. r. nelsoni: Nelson's ptarmigan. Range—Unalaska, Akutan and Unimark Islands, Aleutian Islands.

L. r. atkhensis: Turner's ptarmigan. Range—Atka, one of the Aleutian Islands, Alaska.

L. r. townsendi: Townsend's ptarmigan. Range—Kiska, one of the Aleutian Islands, Alaska.

L. r. chamberlaini: Adak ptarmigan. Range—Adak, one of the Aleutian Islands, Alaska.

L. r. dixonii: Dixon's ptarmigan. Range—Islands near Sitka, Alaska.

Lagopus evermanni: Evermann's ptarmigan. Range—Attu, one of the Aleutian Islands, Alaska.

Lagopus welchi: Welch's ptarmigan. Range—Newfoundland.

Lagopus leucurus: Range—Mountains of Alaska and British Columbia, south in the Rocky Mountains to New Mexico.

L. l. leucurus: White-tailed ptarmigan. Range—Rocky mountains from northern British Columbia and central Alberta south to Vancouver Island, Washington, north-western Montana, Colorado, and northern New Mexico.

L. l. peninsularis: Kenai White-tailed ptarmigan. Range—Alpine summits from central Alaska, northern Yukon, and north-western Mackenzie south to Cook Inlet region, Kenai Peninsula, and southern Yukon.

At certain seasons of the year many of our sportsmen hunt through Newfoundland, various parts of the Dominion of Canada, and in Alaska, including several of its off-lying islands. During such trips, they are likely to meet with snow grouse or ptarmigan, and if they obtain any of them, they are naturally desirous of knowing their names or the species they may represent.

By consulting the RANGES given in the above list, quite a number of these ptarmigans can be identified at once from their habitats,—that is, at this writing; for, later on, other species or subspecies may be discovered in one or more of the same habitats. However, if one now shoots a ptarmigan in Newfoundland, he may be

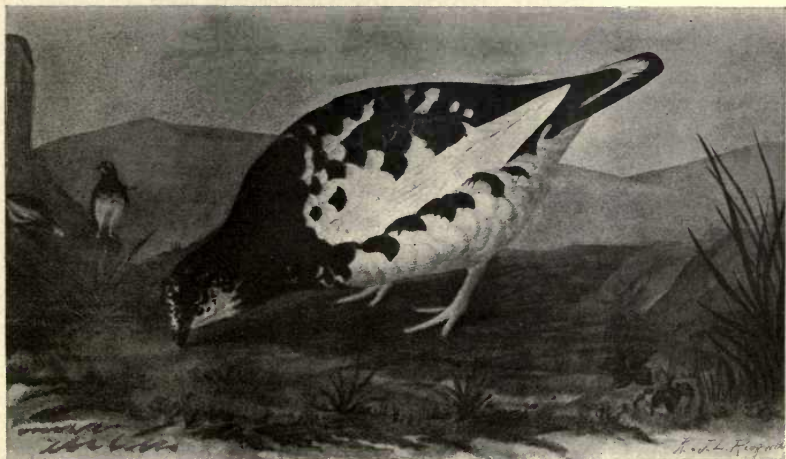


FIG. 12. Nelson's ptarmigan (*Lagopus rupestris nelsoni*); male in spring. Reproduction of a photograph made by the author from the plate in Nelson's Report.

sure that he has a specimen of Allen's ptarmigan; or one in Atka, a Turner's ptarmigan, and so on to the end of the list. It will not be necessary for me, then, to give the plumages or other differential specific characters of all these birds, and I shall confine myself to a few of those of more general distribution which may occur within the boundaries of the United States, exclusive of Alaska, touching very lightly upon some of the forms.

In the winter time, in certain localities, one might meet with the willow grouse or ptarmigan in the northeastern part of the country, but never south of northern New York. It has also occurred in Minnesota. (Fig. 10). The bird has several common names, though it is usually called a willow grouse or a white grouse.

As in all ptarmigans, its feet are fully feathered, and there is no black stripe between the bill and eye. In winter the plumage is pure white with black white-tipped tail which is composed of 14 feathers. Several of the outer flight-feathers of the wings have black shafts, those of the secondaries being white. In the summer time, when the plumage of this species is not white, no detailed description will answer for all the plumages it assumes, as they vary so with sex and age. Nevertheless, there can be no trouble in identifying a willow grouse in any of these stages.

Males in the summer time have the head and fore-parts of an elegant rich chestnut, designated by some as an orange-brown. This becomes tawny on the back, rump and beyond,—the whole being more or less thickly barred with black. For the most part, the wings and all the plumage below remains white. During the spring and autumn, as these changes go on, the bird has a pied plumage which fits no special description. Females have only the white and is lighter colored than the male, the black barring being more uniform, closer and heavier.

Length, 15-17 inches; wing, 7.5 to 8, and tail about 5½ inches. Chicks of this species are truly beautiful little birds, several of them being here shown in Figure 10.

Wilson, apparently, never met with any of our ptarmigan or snow grouse, and therefore does not mention them in his work.

Audubon, who could find no differences in our several forms of ruffed grouse (Part II), seemed to think—in fact did think—that our willow ptarmigan, or some other species found in the Old World, were entirely different birds, and consequently named ours the American ptarmigan (*Lagopus americanus*); whereas—as nearly every one knew at the time—the birds are identical. In fact, Audu-

bon tangled up the rock ptarmigan, the present species, and his American ptarmigan in the most remarkable manner with *L. scoticus* and *L. mutus*! He could not even trust his own figures; for he says in Vol. V of his work: "At the same time, after due consideration, I am satisfied that the bird figured by me is not the Common Ptarmigan, although it presents all the characters of the Rock Grouse or Ptarmigan. It is less than the Scotch Ptarmigan, and its wings are much shorter, and even more concave; and in these respects it corresponded with the other two specimens, [loaned him by the Earl of Derby], which, however, had the plumage pure white, with the exception of the tail-feathers and the shafts of the primaries. I have therefore named this bird, as a species distinct from either, *Lagopus Americanus*." (Pp. 119, 120). The birds he examined in the Museum of the Andersonian Institution marked "*Lagopus vulgaris*, Ptarmigan, Melville's Island," and which he claimed to be his *Lagopus americanus*, were evidently nothing of the kind, but at least one of them—and perhaps all—were rock ptarmigans (*L. rupestris rupestris*), for he says himself that they had a "black band extending from the bill to the eye and behind it,"—and this is a distinguishing character of the rock ptarmigans, and is not found in the willow grouse (Fig. 11). So far as I am aware, this error has not been published before, and it is pointed out here in order that students of Audubon—many of whom believe that he never made any mistakes—may avoid unnecessary labor in demonstrating them.

An authority at hand says that in Allen's ptarmigan "both secondaries and primaries black-shafted, and these and some of the coverts marked on their webs with blackish,"—otherwise the bird is like the willow grouse.

Coming next to the rock ptarmigan (*L. rupestris*), (Fig. 11), with its seven subspecies, we have a series of birds that do not normally come within the boundaries of the United States proper, and can only claim places in our avifauna for the reason that they all, with the exception of Reinhardt's ptarmigan, occur in various parts of Alaska and her off-lying islands.

In the white winter plumage, the rock ptarmigan is like the willow grouse, with the above-mentioned difference that there is, in the former, a black stripe from the bill through the eye on either side. Rock ptarmigans also have a slenderer bill than do willow grouse. Sometimes the female lacks the black stripe through the eye, and both sexes are, respectively, smaller than the male and female of *lagopus*.



Fig. 13. White-tailed ptarmigan (*Lagopus l. leucurus*). Male and female in winter plumage. Reproduction of a drawing made by the author. Sexes alike.

Length from thirteen to fourteen and three-quarter inches.

When the summer plumage is complete, the sexes are, in the main, alike again. Apart from the wings and tail it is barred with dusky brown and ochre in coarse, wavy markings, being blotched on the dorsum. Males, beneath, white.

This bird gets its specific name from the Latin *rupis*, a rock,—*rupestrine*,—hence *rupestris*.

Coues, who seemed to fail to appreciate the subspecific and constant characters of some of the American ptarmigans, says, when speaking of the range of the rock ptarmigan, "supposed not to occur from N. Labrador northward, that region being prudently reserved for *L. r. reinhardtii*; allowed on those Aleutian Islands which are not reserved by the classifiers for some other Rock Ptarmigan." Coues was never in the parts of the country of which he speaks, while the ptarmigan of the last A. O. U. "Check-List" have been accepted everywhere in the world, and compared by a great many expert ornithologists. Even Coues himself in his "Key" admits Reinhardt's, Nelson's, Turner's, Townsend's, Welch's and Evermann's ptarmigans!

Fig. 12, illustrating the present Part, gives a male Nelson's ptarmigan in full spring plumage. This figure appears as Plate X. in the government work entitled "Report upon Natural History Collections made in Alaska between the years 1877 and 1881 by Edward W. Nelson" (Washington, D. C., 1887), from which I photographically copied it. That excellent report contains detailed descriptions of the habits and various plumage changes, at all seasons, of the willow ptarmigan, the rock ptarmigan, Nelson's and Turner's ptarmigan. Another government report (1886), "Contributions to the Natural History of Alaska," by L. M. Turner, gives additional information on these three grouse with colored Plates (III. and IV.), of the male and female of Turner's ptarmigan.

Reinhardt's rock ptarmigan agrees with the rock ptarmigan; but the male of the former in summer is "less regularly and more finely barred above on a grayish brown ground." (Coues).

Female Nelson ptarmigans cannot be distinguished from true *rupestris*; the males in summer have the plumage above finely vermiculated with black on a deep umber-brown ground, while the lower parts are the

same, except that the ground-color is of a tawny shade,—a few black feathers being interspersed.

So it goes with other subspecies of these birds, and even the scientific ornithologists can easily be misled and make mistakes in identifying the majority of these snow grouse. So it will be just as well to remember the caution of Mr. D. G. Elliot in his "Game Birds of North America," when he says, "Comparisons of ptarmigans should be made between individuals not only from the same locality, but also taken in the same month, if possible the same day, for these perplexing birds, being in a constant state of moult, a few days difference in their time of capture exhibits much change in their appearance, and one who has not studied them carefully with sufficient material, could easily be led to form an erroneous opinion regarding the status of a subspecific or even a specific form."

As I have said above, Welch's ptarmigan is a well-marked species of Newfoundland, and Evermann's ptarmigan of Attu, Alaska, is different from any of the foregoing forms (see Fig. 3, Part I.). It is found only upon the Island of Attu.

Grinnell, in describing Dixon's ptarmigan, says that it resembles Nelson's in the corresponding plumage, but is much darker; "in extreme blackness of coloration nearly like *Lagopus evermanni*, but the feathers of chest and back more or less finely vermiculated with hazel."

The Adak ptarmigan (*L. r. chamberlaini*) differs but slightly from Townsend's ptarmigan.

We have a very distinct species in the white-tailed ptarmigan or the Rocky Mountain snow grouse (*L. leucurus leucurus*) which I here portray in Fig. 13, drawn from specimens in the collections of the U. S. National Museum. There is no difficulty in recognizing this bird—specimens of which have been sent me in the flesh from Colorado by Mr. Robert B. McLeod of Leadville—it being rarer *mutus* of the Old World than it is to our rock ptarmigan. Both the male and the female are *pure white* in winter. In summer, the white persists in the lower part of the breast, the wings and the tail white, the remainder of the plumage—differing somewhat in nearly every specimen—is minutely variegated with grayish, brown, tan, and black and white.

There is but one good subspecies known of the white-tailed ptarmigan, namely the Kenai white-tailed ptarmigan of Alaska as given above. Mr. Chapman, who first described this form (Bull. Am. Mus. Nat. Hist. xvi, 1902, 236), says, "nuptial plumage

differs from corresponding phase of plumage of *L. leucurus* in having the black areas of greater extent, the buff areas much paler. In fall, transition or "preliminary" plumage differs from similarly plumaged specimens of *L. leucurus* in being decidedly grayer."

This is all I intend to say here about our ptarmigans or snow grouse. Sportsmen will appreciate—from what I have collected together for them above—that they are a very difficult group of birds to study, especially to identify the many forms of them in the great and puzzling differences of the plumages, particularly when taking the two sexes, the seasons and ages into consideration. However, there is a good insight into the group given here, which, with a knowledge of their distribution—also given—and the figures presented, ought to assist almost any one interested in our grouse to make a correct identification; if it does this much, my labor will not have been in vain.

We next have to deal with an elegant genus of American grouse, the genus *Tympanuchus*, known to hunters everywhere as the prairie hens or prairie chickens. There are, in the United States, three species of these, with two subspecies included in the first one. In the A. O. U. "Check-List" they are arrayed thus:

Tympanuchus americanus: Range—Central North America from southern central Canada south to northern Texas to east (formerly) Ohio.

Tympanuchus americanus americanus: Prairie chicken. Range—Southeastern Saskatchewan and southern Manitoba to eastern Colorado, northeastern Texas, Arkansas, western Kentucky, and Indiana; probably extinct east of Indiana, but formerly reached southwestern Ontario, Michigan, and northwestern Ohio.

Tympanuchus americanus altwateri: Attwater's Prairie Chicken. Range—Coast region of Texas and southwestern Louisiana.

Tympanuchus cupido: Heath Hen. Range—Island of Martha's Vineyard, Massachusetts. Formerly southern New England and parts of the Middle States.

Tympanuchus pallidicinctus: Lesser prairie chicken. Range—Great plains, from Kansas south to west central Texas.

The derivation and meaning of the word *Tympanuchus* has already been given in Part I of this series; the meaning of *americanus* is self-evident, and *altwateri* is for Mr. H. P. Attwater, to whom Bendire dedicated the subspecies.

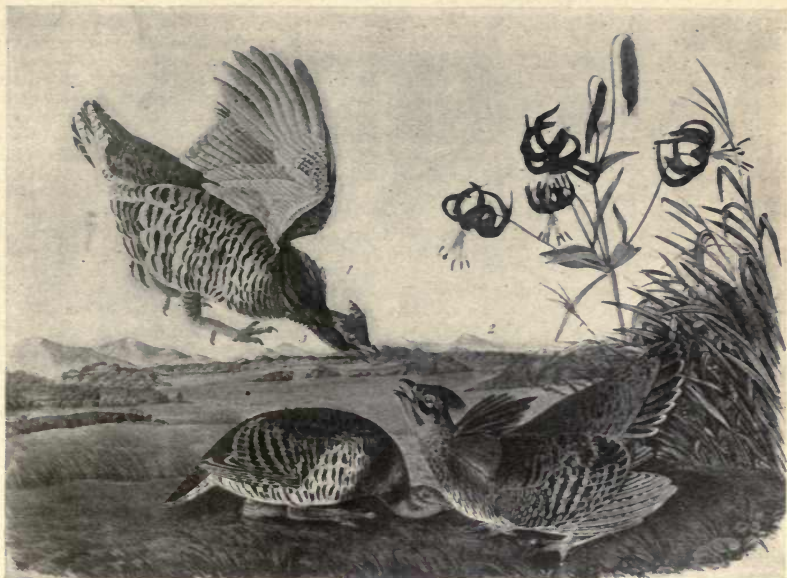


Fig. 14. Prairie Chicken (*Tympanuchus a. americanus*). Two males contesting for female, the latter with head pressed against the ground. Note that she has no crest or neck-tufts. Reproduction of a photograph made by the author of Audubon's plate.

Cupido suggests the wings of the conventional cupid, which are here likened to the feather-tufts on the necks of all birds of this genus. For *pallidicinctus* we have the Latin *pallidus*, pale or pallid, and *cinctus*, encircled, begirdled or begirt, and bestowed upon this species by Ridgway, probably for the reason that in its plumage he saw a *pallid girdle* of some kind, as expressed in this part of his description of the bird: "Darker bars of back and rump, treble, consisting of a perfectly continuous brown bar enclosed between two narrower black bars; darker bars of sides and flanks .25, or less, wide, bicolored, the broader light-brown bar being enclosed between two narrower dusky ones." (*Manual*, p. 203).

In 1868, when I hunted in Illinois, the prairie hens were fairly abundant in that state, and I shot them within two miles of the city of Omaha, Nebraska, in 1879. (Fig. 14).

Typical *americanus* has been described by a great many ornithologists and popular writers; and, as the colors and arrangement of the pattern of the plumage are very variable and complicated, these descriptions are, in most instances, quite different.

As Audubon said of this species, "*T. cupido*" that "The female is considerably smaller, and wants the crest, cervical tufts, and air-bags, but in other respects resembles the male" (Vol. v., p. 105).—a statement of which more than half is utterly erroneous, as the female has both crest and tufts, so we need not consider his idea of the bird at all. His long account of this grouse refers to *T. americanus* and not to *T. cupido*, as he has it, for it is based on Kentucky specimens, although he collected both species. Audubon, assisted by "several negroes," used to bag dozens of them at night just for the sake of "amusement." (loc. cit., p. 98).

Wilson also gives us a long account of the "Pinnated Grouse,—*Tetrao cupido*," which he illustrated with a figure of a male, drawn from a specimen taken in the "Barrens of Kentucky." In his day (1810) the bird was common around Oyster Bay, Huntington, Islip, etc., on Long Island and in New Jersey, etc. He also says of this bird—which is the present Heath Hen (*T. cupido*) of Martha's Vineyard, Mass.—"The female is considerably less; of a lighter color, destitute of the neck wings, the naked, yellow skin on the neck, and the semi-circular comb of yellow

over the eye." (Amer. Ornithol. Brewers' ed. 1852, p. 264).

Ridgway, in his "Manual," (1887) gives the "Common characters" of the genus *Tympanuchus* on p. 202; and although he does not there mention the cervical air-sacs of those grouse as a character, we do find the following: "*Adult male*: Sides of neck with an erectile tuft of rather stiff elongated feathers, the longest of which are 2.50 or more in length; * * * * *Adult female*: Neck tufts rudimentary, the longest feathers not more (usually much less) than 2.00 in length." * * * *

This covers *americanus*, *cupido* and *pallidicinctus*,—that is, in all of these grouse, the females possess "neck-tufts," which may be at least two inches in length,—Audubon and Wilson to the contrary.

With respect to the plumage, Ridgway, in giving the common characters of *Tympanuchus*, says, "Above brownish, barred (sometimes spotted also) with dusky and buff; beneath white broadly barred or banded with brown; quills brownish gray, their outer webs spotted with buff or whitish; chin, throat and cheeks buff, the last marked with a cluster of brown or dusky spots; a dark brown stripe on side of head, from corner of mouth beneath eye and across upper part of ear-coverts; above this a buff stripe, interrupted above the eye,"—and, in characterizing *americanus*, "Darker bars of back and rump single, very broad, solid black; brown bars on sides and flanks .30 or more wide, unicolored."

The sexes are nearly alike, the male being the larger, of the following measurements: Length, 16 to 18 inches; extent, 28; wing, 8 to 9 inches; tail, about 4½. Modern writers have been very full in describing the length, number and form of the neck-tufts in *Tympanuchus*; but not one of them states—so far as I can find—what the color of them is. Wilson, in his quaint way, says of these, "the neck is furnished with supplemental wings, each composed of eighteen feathers, five of which are black, and about three inches long; the rest shorter, also black, streaked laterally with brown, and of unequal lengths." (*T. americanus*: Kentucky).

Ridgway says that in the heath hen (*T. cupido*) the "neck-tufts of adult male composed of not more than ten lanceolate, pointed feathers," and in the lesser prairie hen (*T. pallidicinctus*), "Neck-tufts of adult male with feathers broad and rounded at tips, as in *T. americanus*."

A good-sized prairie hen weighs about 3½ pounds—the smaller subspecies less.

Bendire's description of Attwater's prairie chicken (*T. a. attwateri*) found on the coast region of Texas and southwestern Louisiana, will be found in *Forest and Stream* (xi, No. 20, May 18, 1893, 425). They occur in Refugio Co., it being a form that comes very close to *americanus*.

I will conclude what I have to say about the prairie chickens of this genus in the next Part,—that is Part IV., which will finish this series.

Wop Henderson Has the Floor

By H. A. SCOTFORD



LD Grimes was attending to the wants of a snub nosed urchin who wished four cents worth of oat meal and the rest of the dime in vinegar, Snog Porter was sorting flies out of the dried currants as he ate therefrom, Wop Henderson was trying his knife on the cheese and Sammy Green was transferring the larger portion of the poor box to his

pocket, when the door flew open and in popped Tamarack Jones, his eyes fairly bursting from their sockets as he tried to surround his vanished wind and tell his news at one and the same time.

"Wolves! Wolves!" he strangled out, and in the ensuing excitement Sammy took a chew of sawdust from the egg crate, Snog threw currants on the floor and ate six flies, Wop shaved a sliver from the cheese box and started to chew it and Grimes carefully tied the vinegar into a paper sack.

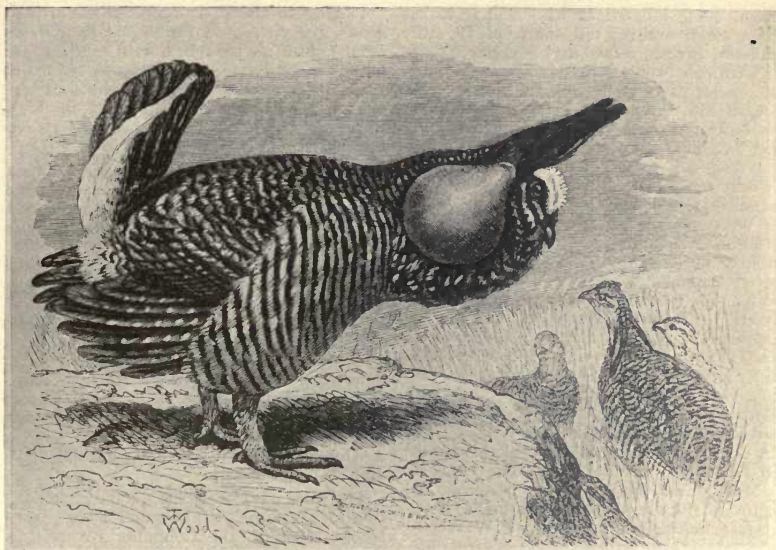


Fig. 15. Male of heath hen (*Tympanuchus cupido*). Drawing by T. W. Wood. Photographically copied by the author from Darwin's "The Descent of Man."

The American Grouse and Their Identification

By DR. R. W. SHUFELDT

PRAIRIE CHICKENS (*Concluded*). SHARP-TAILED GROUSE; SAGE HEN

PART IV.

WITH ILLUSTRATIONS FROM DRAWINGS AND PHOTOGRAPHS BY THE AUTHOR



O continue my descriptions of prairie chickens of the genus *Tympanuchus* which, for the lack of space, I could not complete in Part III of the present series.

The woodland heath hen, or pinnated grouse of Martha's Vineyard, is the *Tympanuchus cupido* of science. It is smaller than any of the other forms of this genus, and a century or more ago it was an abundant bird on certain parts of Long Island and on a considerable portion of the states of the

Atlantic, down into Virginia. As before stated, it is being strictly protected on Martha's Vineyard, Massachusetts, where a few pairs are still in existence,—about 300 birds altogether.

Eaton, in his *Birds of New York*, gives us a good cut of the heath hen, it being a reproduction of a photograph of the mounted specimen in the Museum of Vassar College. His description of the bird is apparently for both sexes, being as follows: "Tarsi lightly feathered to the toes; a tuft of from seven to ten elongated pointed feathers on each side of the neck over the naked membrane, which is very distensible in the mating

season, being inflated at will until it looks like a small orange; tail short, of 18 stiff feathers; breast meat dark; upper parts light reddish brown barred with dusky and buff; under parts white broadly barred with brown; chin, throat, cheeks and stripe over eye buffy. Length 16 inches; extent 27; wing 8.35-8.6; tail 4. Female smaller; wing 8; darker and rustier." (p. 376).

Coues remarks that this bird very closely resembles the common pinnated grouse of the West and says, quoting some other authority which he does not name, "neck-tufts composed of from three to five narrow, acutely lance-pointed, stiffened feathers, with about the same number of overlapping coverts." Ridgway states of this species "Scapulars with large and very conspicuous terminal spots of buffy whitish; neck-tufts of adult male composed of not more than ten lanceolate, pointed feathers." (Manual, p. 203). Coues confirms the scapulars being spotted by the feathers having whitish tips.

A pretty good figure is given of this heath hen (*T. cupido*) in Darwin's "The Descent of Man," and this is here reproduced as Figure 15 from a photograph I made of it. It is from an original drawing by T. W. Wood, and represents the male in the act of strutting.

In the Northwest, the common prairie chicken not unfrequently crosses with the sharp-tailed grouse—either the prairie or the Columbian—and if such interesting hybrids are met with by sportsmen, they should, if possible, be preserved. Years ago, I published an account of the skeleton of one of these hybrids, sent me by the distinguished ornithologist of Cambridge, Massachusetts, Mr. William Brewster.

As in the case of *T. cupido*, the lesser prairie chicken (*T. pallidicinctus*) is smaller than *americanus*, and its markings above are more of a brown than black, the dark ones not being in excess of the light, the transverse bars being brown with narrow edges. Beneath, the narrow dark bars are inclined to enclose a broad brown one between any two dusky ones.

In this species, the tarsi are very light feathered, to the extent of having an unfeathered longitudinal strip posteriorly.

This pale pinnated grouse is the one we find in Kansas and Indian territory, down into Texas; while further down, coast-wise, in the latter state and Louisiana, we get Attwater's,—the heath hen is the Martha's Vineyard one; the rest are the common prairie chicken.

With this, and the data I have given above, one can identify any of the prairie chickens of the genus *Tympanuchus* in this country, including those found in Alaska.

Passing to the sharp-tailed grouse of the genus *Pediacetes* and the sage hen (*Centrocercus*), it is as though I were meeting old friends of by-gone days, for I was for many years in the country where both were extremely abundant, and it would be hard for me to say how many of them have fallen for my gun.

For *Pediacetes*, we have the sharp-tailed grouse, *P. p. phasianellus*, an elegant game bird ranging through "Central Alaska and northwestern British Columbia east through central Keewatin to central western Ungava, and south to Lake Superior and the Parry Sound district, Ontario, casual east to Saguenay River, Quebec." (A. O. U. "Check-List"). It is therefore not a representative of our avifauna, while the two subspecies of the genus are,—the better known to us being the Columbian sharp-tailed grouse (*P. phasianellus columbianus*). This form has a range extending through central British Columbia and central Alberta southward to northeastern California, Utah and central Colorado.

The word *phasianellus* is the Latin diminutive of *phasianus*, a pheasant, while *columbianus* refers to the Columbia River. In the case of our second subspecies, the prairie sharp-tailed grouse (*P. p. campestris*), its subspecific name is also from the Latin,—*campus* meaning an extensive open area or plain. This bird ranges through southern Alberta and southern Manitoba, to Wyoming, Kansas and northern Illinois.

The Columbian sharp-tailed grouse has received numerous common names, one or more being applied to it in any section of its range. Throughout the Northwest, it is generally known as the prairie chicken; it is also called the pin-spike—or sprig-tailed grouse, etc., or these terms without the word grouse being used. I have been in sections of the Northwest where they are simply called "pin-tails." As elsewhere stated, they will cross with the pinnated grouse, and numerous hybrids have been taken.

Audubon's account of the habits of the sharp-tailed grouse was furnished him by Sir John Richardson, Mr. Higgins and Townsend, and it fully agrees with my own observations of this bird. He states that the bird was unknown to him, and, unfortunately, he does not say who loaned him the skins of this species from which he made his plate (Vol. V., No. 60, Pl. 298), and from which he made his descriptions of plumage, etc. I have photographed this plate and it is here reproduced as Figure 16; the pair of birds there shown have—to me—the appearance of the Columbian sharp-tailed grouse.

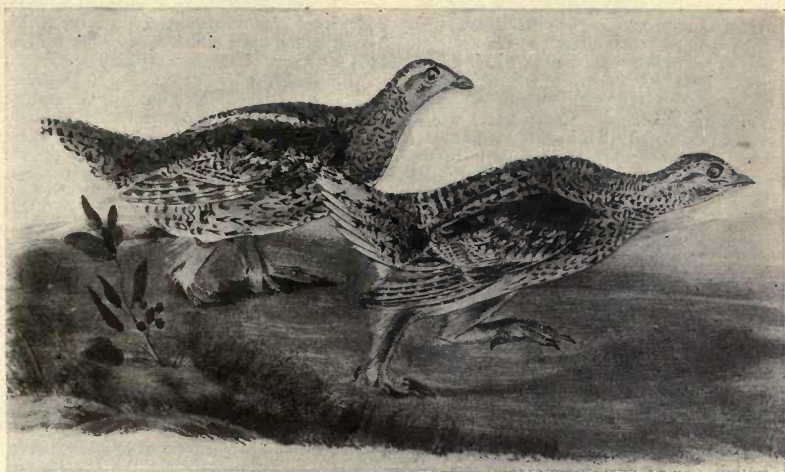


Fig. 16. Sharp-tailed grouse (*Pedioecetes phasianellus* probably *columbianus*). Reproduced from a photograph by the author of Audubon's plate. The male is in advance of the female.

The sharp-tailed grouse found around Hudson's Bay was, as long ago as 1758, first designated by Linnæus (*Syst. Nat.* ed. 10, I. 160, *Tetrao phasianellus*), and it is stated that Lewis and Clark, in 1805-6, were the discoverers of the Columbian sharp-tailed grouse; if they furnished Audubon with his material, the birds in Figure 16 are of that subspecies. If he got them from Richardson, they are probably *phasianellus*, but I have not the data at hand to settle this point at the present time. It was Lewis and Clark who noted that the scales in the summer time come off the toes in these grouse, which is an interesting fact. In all the forms, the female is smaller than the male, and the tints of her plumage paler. Pullets and chicks have special plumages for description, but our space will not admit of giving such information here.

In the adults, the tail of this grouse will at once suggest the genus to which it belongs on account of the elongated, two central feathers with their *square ends*, as shown in the Figure. So it remains only to furnish data, by means of which one can determine the *subspecies*. In this, one will be helped by knowing where the specimen—or specimens—were shot,—that is, *the range*. Further assistance will be found in making a comparison with the birds in Figure 16, which, as a matter of fact, presents the remarkable plumage markings of this grouse, apart from the question of color. It is on account

of the blacks, browns, dusky shades, buffs, white, grays, tawny, and the rest for colors found in the plumages of this group of grouse and the markings on the feathers in various parts of the plumage, as spots, "V-shaped marks," streaks, bars, irregular dots; U-shaped spots, "sharp-angled stars," speckles, "guttiform spots," etc., that furnishes the reason why authors have been compelled to give us such lengthy descriptions of the appearance of the established forms, in so far as the plumages are concerned.

Ridgway, in his "Manual," does not mention how many feathers compose the tail in a sharp-tailed grouse; Audubon says there are 16, and Coues, in his "Key," says 18, which is correct, the two elongated middle feathers being colored above like the back. Audubon probably overlooked them, counted 8 on either side,—and hence 16.

Coues, in describing the *male* and *female* of the Columbian sharp-tailed grouse (*P. p. columbianus*), says that the "Upper parts closely and pretty evenly variegated with blackish-brown, reddish-brown, and grayish-brown, the pattern smallest on rump and lower back, where the blackish is mostly in sharp-angled stars; the reddish most conspicuous on upper back, and both the lighter colors everywhere finely sprinkled with blackish. Wing-coverts like upper back, but with numerous conspicuous rounded white spots, one on end of each feather. Crown and back of neck nearly like back, but in smaller

pattern, and the markings mostly transverse. An illy-defined white area on each side of neck, over tympanum, and slight whitish stripe behind eye. Throat fine light buff, usually immaculate, but sometimes finely speckled quite across. Under parts white, more or less tinted with buff toward throat; breast with numerous regular dark brown U-shaped spots, one on each feather; similar but smaller, sharper and fewer such spots thence scattered over most of the under parts, only middle of belly being left unmarked. Long feathers of sides under wings matching upper wing-coverts nearly; under wing-coverts and auxiliaries pure white, not marked; flanks with bars or V-spots of dark brown. Legs grayish-white, unmarked. Quills of wings fuscous; outer webs of secondaries with equidistant, squarish, white or tawny spots, secondaries tipped and imperfectly twice or thrice barred with white, and gradually becoming sprinkled with the varied color of back, so that the innermost of them are almost precisely like greater coverts. Four middle tail-feathers variegated, much like back; others white or grayish-white on inner webs, the outer webs being mottled; a few under tail-coverts spotted, the rest white; upper tail-coverts nearly like rump. Iris light brown; bill dark horn-color; part of under mandible flesh-colored; claws like bill; toes on top light horn-color, soles darker. Length 18.00-20.00; extent 24.00-30.00; wing 8.00-9.00; middle tail-feathers 4.00-6.00; shortest tail-feathers (outermost) about 1.50 inches." ("Key", 5th edition, 1903, pp. 737, 738).

Surely no one will ever miss identifying a Columbian sharp-tailed grouse from *this* description. I quote it in full, in preference to any other known to me, in order that it may be passed along as *standard*. When read, it should be compared with Figure 16 of the present Part. I can fully endorse it as agreeing with my own observations.

Ridgway first described the prairie sharp-tailed grouse (*Pediocetes phasianellus campestris*), believing, as he did, that the specimens he examined were "above more rusty or ochraceous," and Coues, in his "Key," records "the name without further remark." (Proc. Biol. Soc. Wash. II, Apr. 10, 1884, 93). The compilers of the A. O. U. "Check-List" (3rd ed. 1910) have recognized the subspecies (p. 144), and it is therefore listed here. At the limits of their several ranges, these sharp-tailed grouse imperceptibly grade into each other, and so we find examples, the plumages of which—and to some extent other characters—would require special descriptions to record them, as they depart—in one particular or another, or in several particu-

lars—from the recognized type forms. By taking a map upon which may be plotted out *all* the ranges of the several kinds of grouse of this genus, it will at once be appreciated in which parts of this country, Alaska, or the Dominion of Canada we would be likely to meet with the "intermediates," and where we would not; and finally, where the typical representatives of any of the three subspecies would occur.

There is but one more grouse left for me to consider in the present contribution, and it is the largest of all our American ones. This is the sage hen, known also as the sage cock and "cock of the plains," *Centrocercus urophasianus* (Gr. *oura*, tail, and *phasianus*, a pheasant).

This magnificent representative of the *Tetraonidae* is an inhabitant of the sagebrush plains of middle eastern California, New Mexico and Arizona, northwestern Nebraska, and still northward to 49° farther, into British Columbia, southern Saskatchewan, Alberta, thence in northwestern Dakota and Missouri Basin. I found it very abundant on the eastern slopes of the Rocky Mountains, in Wyoming and northward. It is—or was—to be found in immense flocks on the sage plains of certain parts of Utah, Idaho, Nevada and Oregon.

On the plains in western Wyoming, south of the Owl Creek Mountains, I frequently met with flocks numbering several hundreds in the latter 70's. I knew of a man who rode through such a flock and killed over a dozen by knocking them over with his "quirt;" indeed, such wanton amusement was by no means uncommon.

Up to date, there has been but one species of sage cock described; it was Swainson who created the genus about 1831 or 32, and Bonaparte named the bird *Tetro urophasianus* in 1827 (Zool. Jour. III. 213),—hence the name it bears.

Wilson never knew of its existence, and Audubon saw only a few skins of them. His account of the bird—which he called the pheasant-tailed grouse—consists of three published letters, one from Townsend, one from Nuttall and one from Douglas. Those from the two first-named naturalists are excellent, and the statements in them true and interesting. Its flight, as described by Douglas, is entirely incorrect, and, when describing the courtship of the male, his statement that "the bare yellow oesophagus inflated to a prodigious size,—fully half as large as his body, and, from its soft membranous substance, being well contrasted with the scale-like feathers," etc., etc., is not only untrue, but ridiculous.

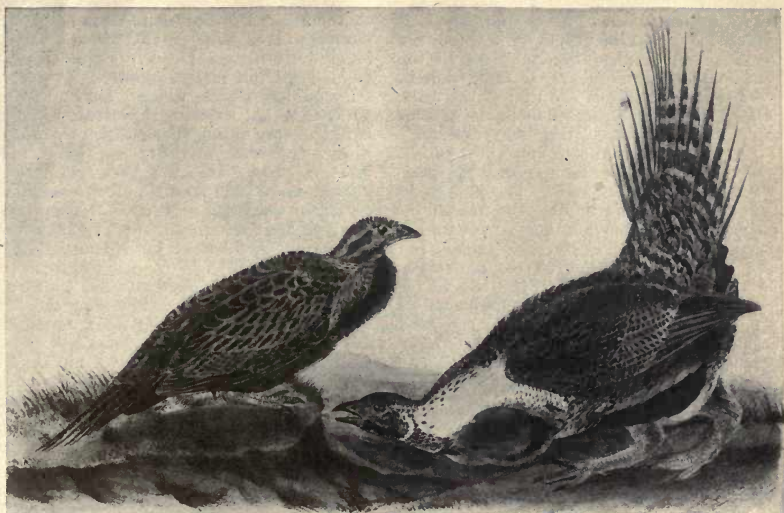


Fig. 17. Male and female of the sage hen (*Centrocercus urophasianus*). Male with tail erect. Reproduction of Audubon's plate from a photograph of it by the author.

In Figure 17 I herewith reproduce, by means of photography, Audubon's plate of a pair of sage cocks, which fairly well represents them. He says of the latter, however, that "In some individuals, as I am informed by Mr. Townsend, the hair-like shafts of the feathers on the sides of the neck are considerably longer than in my figure of the male," which, I may add, is very true.

Personally, I am of the opinion that these birds do not gain their full size until about the third summer, as this and the weight of the sexes vary so. Males run from four to upwards of eight pounds, and females—which are about a third smaller than the cocks—never over five pounds.

Males, having attained their full size, are about two and a half feet long; wing extent about a yard, and the tail averages a foot or more. The under parts are mostly white, with an area of deep black on the abdomen; above, the prevailing colors are buff, gray, black and brown, exhibiting considerable variation.

The feathers on either side of the neck are stiff and wiry, especially at their bases. These lateral cervical patches meet each other in front, and the feathers composing them have their ends produced as filamentous extensions, three or four inches long, of a peculiar kind. During the breeding season, these all wear down, leaving but stiff, scale-

like remnants to represent them. It is anterior to these curious feather tracts that we find the nude tympana which are capable of such enormous inflation with air during the amatory display and strutting of the cock before the hens when courting. Either air-sac has above it a tuft of much softer feathers, over which are to be found still others of a plumbaceous sort, which seem to represent the firmer and far better developed ones in the pinnated and ruffed grouse. On the breast, most of the feathers are coarse and bristly, having, as in the case of those of the lower neck in front, been worn down to mere scales and threads in his antics before the females of his harem, to prove to them that the breeding season is at hand, and how much he thinks of them.

The scaly kind have dirty, white bases with their filamentous ends dusky, the softer, downy ones all being pure white, while over all there are the deep black and glossy plumes of this part of the bird's plumage. Entire throat black, with the ends of the feathers speckled with white, these massing to form below a white semi-color. (Fig. 17). Inside of wings white. Lower tail-coverts black, broadly tipped with white.

The pattern of the tail and upper tail-coverts are well shown in Figure 17.

In the female the throat is not black, but on the contrary with the chin is pure white,

while the black below, on the fore-chest, is replaced by speckled gray. In her, too, the air-sacs are rudimentary, and none of the neck-feathers are peculiar. In fact, while in general her plumage is like that of the male, it is nevertheless more subdued, the shorter and softer feathers tapering more rapidly.

I have published the osteology of the adults, pullets and chicks of this species from specimens collected by myself. The pullets, in September, are much like the female in plumage, and their hunting is not to be despised as they are excellent table-fowls. The adults have their flesh too powerfully impregnated with the taste of the leaves and buds of the artemisia they feed upon as a part of their diet to be pronounced good eating. It goes pretty well, however, when one is very hungry and has not seen any fresh meat for a long time, particularly if the hunter will take the pains to "draw" the bird as soon as shot.

The digestive tract of *Centrocercus* is worthy of a more careful and complete

anatomical description than it has hitherto received. It is quite different from what we find in the other genera. Years ago, J. A. Audubon pointed out this fact as follows: "A peculiarity of this species, which I have not seen noticed, is that its stomach, instead of being hard and very muscular as in other *Gallinacea* is soft and membranous, like that of the birds of prey. This was first told me by hunters in Nevada, and I afterward satisfied myself of the truth of their statement that the sage hen "has no gizzard," by dissecting a sufficient number of individuals." (Am. Nat. VIII., 1874).

This fact I have demonstrated a number of times for my own satisfaction, the first dissection of the kind being upon an unusually large male bird, which I opened with a hunting-knife on the pommel of my saddle, while riding after Indians in 1879 in Wyoming, and attached as surgeon to a large military outfit in the field. It surely was a case of pursuing the study of avian anatomy under peculiar circumstances.

An Unorthodox Bear Story

By PAUL E. TRIEM



DID I ever hunt bears?" the old man Browning repeated. "Did you ever hunt earthquakes?"

Mr. Todd admitted that he never had.

"Well, it'd be just as safe as bear hunting, and there'd be more amuse-

ment in it, to my way of thinking," the old man assured him.

"But your nephew?" Mr. Todd suggested.

"I'm not responsible for any of Charlie's foolishness," Mr. Browning said. Then catching a look of disappointment on Mr. Todd's face, the old man relented a little.

"I suppose you're looking for information about bears, and came to me because you couldn't get Charlie to talk?" he queried.

Mr. Todd admitted that he found the younger Browning rather uncommunicative.

"Well," Mr. Browning said, "I had a misunderstanding with a bear the first year

after I came to live with Charlie that shows how near a man can come to playing second fiddle in a bear fight and still get out alive; as that seems to be the main part of every bear story I ever heard, it'll probably answer as well as if I'd gone out for the very purpose of getting into trouble."

The old man made this remark tentatively; apparently he was not sure that Mr. Todd would care to hear a bear story that savored of the unorthodox.

"The bear's the thing I'm interested in," Mr. Todd assured him. "I don't care whether you hunted him or whether he hunted you."

"Thank you," the old man said grimly. "I cared considerable at the time, but I'm getting to look at it the same as you do. As I said, it was the first year after I came west; I hadn't learned to shoot—didn't care much for meat, anyhow—but I could fish and I'd pretty well caught the knack of spearing salmon."

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By PAUL E. TRIEM



DID I ever hunt bears?" old man Browning repeated. "Did you ever hunt earthquakes?"

Mr. Todd admitted that he never had.

"Well, it'd be just as safe as bear hunting, and there'd be more amuse-

ment in it, to my way of thinking," the old man assured him.

"But your nephew?" Mr. Todd suggested.

"I'm not responsible for any of Charlie's foolishness," Mr. Browning said. Then catching a look of disappointment on Mr. Todd's face, the old man relented a little.

"I suppose you're looking for information about bears, and came to me because you couldn't get Charlie to talk?" he queried.

Mr. Todd admitted that he found the younger Browning rather uncommunica-

tive. "Well," Mr. Browning said, "I had a misunderstanding with a bear the first year

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